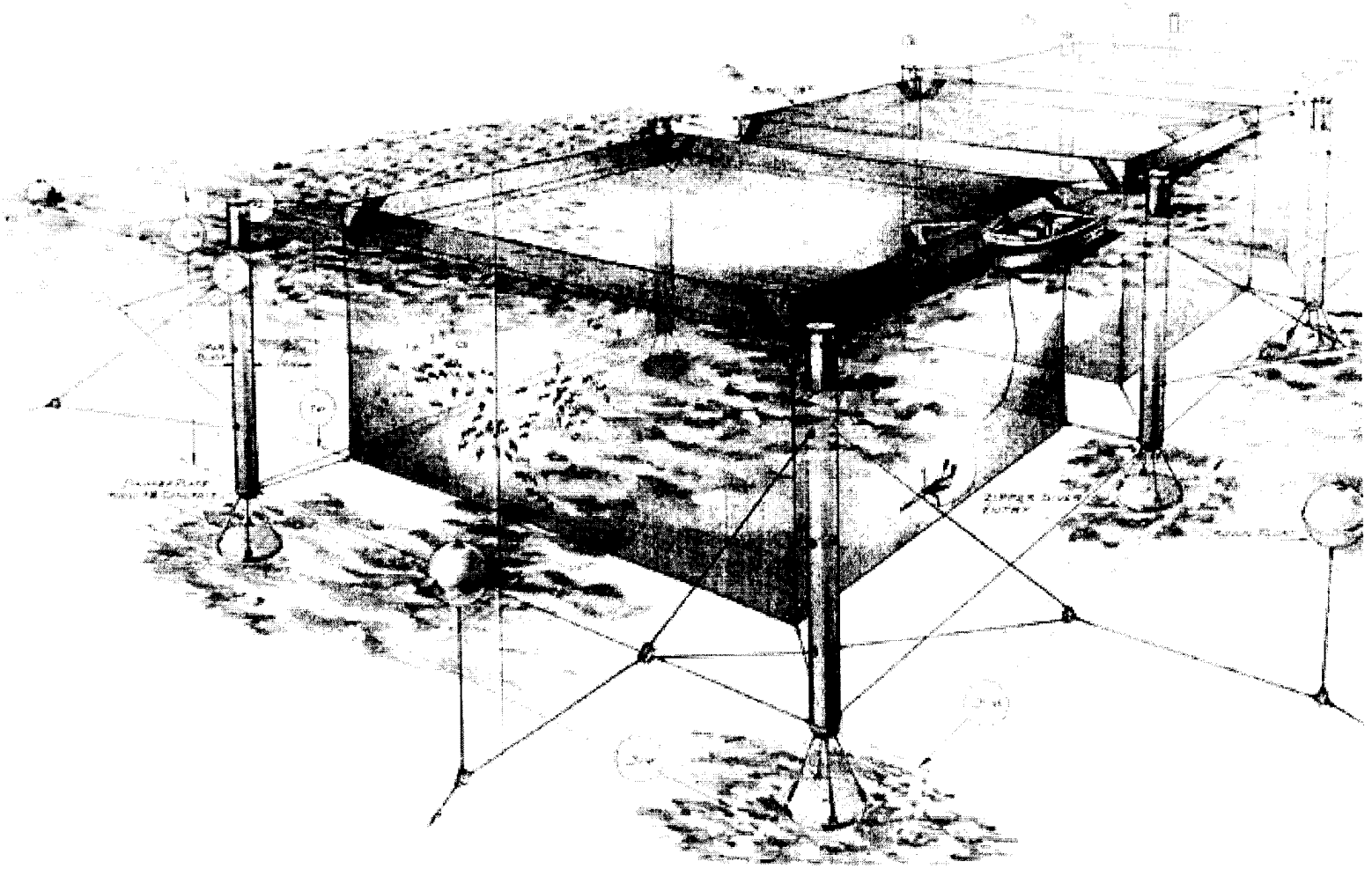
Fourth Report to the Legislature
State of Hawaii
2003 Regular Session

Implementation of Chapter 190D, Hawaii Revised Statutes
Ocean and Submerged Lands Leasing



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In response to Act 176 (Section 12), Session Laws of Hawaii 1999
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Front Cover. Artist rendition of the Ocean Spar ™ Sea Cage System, a state-of the-art of floating cage design by Ocean Spar Technologies, L.L.C. of Bainbridge Island, Washington, and in commercial use around the world.

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1.0 Introduction

Act 176, Session Laws (SLH) 1999, was enacted on July 1, 1999, allowing potential utilization of Hawaii's ocean resources for research and sustainable development of open ocean aquaculture. Specifically the Act amended an existing law, Chapter 190D, Hawaii Revised Statutes (HRS), Ocean and Submerged Lands Leasing, and effected many important changes including:

- Permit commercial mariculture projects under Chapter 190D, HRS;

- Remove size restrictions on mariculture leases;

- Define the water surface, water column and submerged lands beneath them as one economic unit for purposes of this chapter and calculating lease rent;

- Allow processing of ocean leases under Chapter 190D, HRS, without prior authorization of the Legislature by concurrent resolution; and

- Permit each lease to describe the degree of exclusive use or access to the site by the public.

The 1999 legislation also provided for repeal of the amendments, after five years, unless the Legislature authorizes extension. In effect, a five-year "window" was provided to develop and test a trial process to lease ocean space around the Islands to an unspecified number of aquaculture projects. This approach allowed Hawaii to gain direct environmental and economic experience with leasing the ocean for commercial aquaculture. But during the 2002 Legislative session, progress in implementing the amended Chapter 190D was reviewed and the Legislature made the amendments permanent (Act 203), underscoring State efforts to sustainably develop open ocean aquaculture.

The law also requires the Department of Land and Natural Resources (DLNR), in cooperation with the Department of Agriculture (DOA), to submit a progress report to the Legislature on the implementation process prior to each regular session. This Report, the fourth in the series, addresses the progress with implementing ocean leasing, as well as, highlights of related national and local research and development initiatives in 2002.

2.0 National Activities and Hawaii Participation

In 1999, the U.S. Department of Commerce (DOC) established a bold long-term, national vision for the U.S. marine aquaculture industry. Ambitious objectives to be met by 2025 included:

a. Increase the value of domestic aquaculture production from the present $900 million annually to $5 billion;

b. Increase the number of jobs in aquaculture from the present estimate of 180,000 to 600,000;

c. Develop aquaculture technologies and methods both to improve production and safeguard the environment, emphasizing where possible those technologies that employ pollution prevention;

d. Double the value of non-food products and services produced by aquaculture in order to increase industry diversification;

e. Enhance depleted wild fish stocks through aquaculture, thereby increasing the value of both commercial and recreational landings; and

f. Increase exports of U.S. aquaculture goods and services from the present value of $500 million annually to $2.5 billion (U.S. DOC, 1999).

Hawaii, with its abundant marine resources, is striving to play a key role in the implementation of this new national policy for marine aquaculture (Table 1). For example, in 1999 and 2000, a collaboration of private, State and University parties demonstrated the economic and environmental feasibility of offshore cage

culture in Hawaiian waters. The federally funded Hawaii Offshore Aquaculture Research Project (HOARP) produced and sold 115,148 pounds of the popular local fish, moi or Pacific threadfin, from a cage that for the first time operated totally submerged (Sea Technology, 2001).

Table 1: Hawaii's Marine Resources

Island Chain	-	1,500 miles long
Coastline	-	746 miles
State Marine Waters	-	2.8 million acres
Federal Marine Waters	-	565 million acres

Two important national ocean-related meetings that took place in Hawaii in 2002 should be mentioned. The U.S. Commission on Ocean Policy held a two-day public meeting on May 13 and 14 in Honolulu to hear testimony on issues related to U.S. ocean policy and management. DLNR Chairperson, Gilbert Coloma-Agaran presented the State's testimony on a variety of Hawaii's ocean-related use, management, conservation and enforcement issues, including the State's desire to develop sustainable offshore aquaculture. The Commission also received comments on the future of offshore fish farming from Randy Cates, President of Cates International Inc., whose company has the first commercial

open ocean aquaculture lease in the nation. The Commission, under the chairmanship of Retired Admiral James D. Watkins, is charged by Congress with reviewing and making recommendations for changes in national ocean policy by late 2003 and these recommendations are expected to have a profound effect on Hawaii's relationship to the ocean.

On October 9-12, 2002, Hawaii hosted another important meeting relating to U.S. offshore aquaculture development. The U.S.-Korea Technical Meeting on Polyculture and Offshore Aquaculture Technology was organized by the International Activities Office of the NOAA, U.S. DOC and the National Sea Grant Program to bring Korean scientists and government officials together with U.S. scientists from around the country working in marine aquaculture and offshore technologies, to discuss long-term cooperative research and development of ocean farming. Hawaii government, research and commercial interests were represented at the meeting and field trips were carried out to research and commercial sites. The outcome was a draft five-year research agenda and plan for exchange of technologies, that would in part call on Hawaii expertise.

Overall, the State growth strategy for open ocean aquaculture has focused on developing a critical mass of research and development activities to further demonstrate the long-term sustainability of moving the Hawaii aquaculture industry offshore.

2.1 National Marine Initiative, National Sea Grant Program

The National Sea Grant Program in 1999 established a National Strategic Research Initiative in marine aquaculture. The initiative strives to fund innovative research, policy, and regulatory analysis and development, and outreach and demonstration for the development of marine aquaculture in the United States. Approximately $5M a year is being made available for this initiative and open ocean aquaculture is a priority target for the program. The overall purpose of the ongoing effort is to develop a highly competitive, sustainable marine industry that will meet growing consumer demand for aquatic foods and products.

Outside Hawaii, there are four offshore cage culture demonstration projects currently funded by the national initiative, i.e., marine fish and shellfish culture off New Hampshire, marine fish culture off Puerto Rico, marine fish culture in the Gulf of Mexico off Mississippi using an oil platform, and marine fish culture using an oil platform off California. All these projects consist of one or two cages with various species of fish at less than commercial stocking densities. In addition, there are numerous individual research projects at various universities focused on such topics as increasing the variety of marine species available for stocking aquaculture projects, new technologies for improved farming and various planning and policy issues related to U.S. offshore development.

This National Sea Grant initiative funded the highly successful HOARP effort off Ewa Beach, Oahu (Ostrowski et al., 2001). During the current funding cycle, Hawaii interests again received a portion of the available funds.

A joint research project between the Oceanic Institute and University of Hawaii received $800,000 to define constraints associated with the impacts of cage culture on water quality, particularly as they affect Zone of Mixing (ZOM) regulations for cage effluents. ZOM is a regulatory approach that defines an area of ocean where water quality standards can be exceeded, thus allowing dilution of effluents (Bay 1995). Specifically, this research is utilizing the commercial project being developed by Cates International, Inc. to carry out the following: 1) Develop a computer model to determine the size and shape of the regulatory mixing zone for cage effluents; 2) Conduct water quality and organic loading surveys to collect data to develop and test the ZOM model; and 3) Collect oceanographic surveys to provide data to develop and test the ZOM model. In addition, additional research will be carried out by the Oceanic Institute (OI) on hatchery techniques for other economically important Hawaiian species.

It is interesting to note that initial water quality measurements have indicated little or no impacts near the cages due to the feed management techniques employed and the active wind and current regimes at the site.

2.2 Leasing Regime Federal Marine Waters

In late 1999 and 2000, the Center for the Study of Marine Policy, University of Delaware completed a collaborative, multi-disciplinary study to develop a policy framework for governing marine aquaculture in Federal waters off the coast of the United States. The intent of the work was to support ongoing and future policy initiatives within the Federal government with respect to offshore aquaculture; leading eventually to development of a general policy for U.S. management of all resources in the Exclusive Economic Zone (EEZ). The Manager of DOA's Hawaii Aquaculture Development Program (ADP) was asked to serve on the Advisory Committee and share Hawaii's recent experiences with offshore aquaculture development.

The report to the Congress, titled "Development of a Policy Framework for Offshore Marine Aquaculture in the 3-200 Mile U.S. Ocean Zone" included 15 recommendations covering: planning, permitting, environmental reviews and public participation, leasing, administering agency, operations and monitoring and abandonment of facilities (Cicin-Sain et al., 2001).

As a result of the successful policy study, a follow-on proposal was made by the University of Delaware to the National Sea Grant Office entitled, "Development and Testing of an Operational Framework for Offshore Aquaculture in Conjunction with Stakeholders at National and Regional Levels" and was funded for two years at $488,000. The ADP Manager was asked to be a member of the multi-disciplinary, multi-regional team to carry out the study. The team will

develop operational guidelines for implementation of a policy framework reflecting input from federal agencies, coastal states, and stakeholder groups, then test and tailor the operational framework in three regions currently involved in offshore aquaculture: New England, the Gulf of Mexico and Hawaii and the Pacific.

At this writing, during 2002 the project team has held four regional stakeholder workshops and one national workshop to solicit input on the first draft ideas for operational guidelines for leasing sites for commercial aquaculture in the EEZ. The Hawaii and Pacific Islands workshop was held October 3, 2002 at the East-West Center and was attended by 39 people. A second draft of the report is now being prepared for wider stakeholder review that includes sections on: Planning and Site Assessment; Joint Permitting; Environmental Review; Leasing of Offshore Sites; Operation and Monitoring of Facilities; Compliance and Enforcement; and Administration and Implementation.

The Team is planning to hold a second National Workshop in Washington, D.C. in April or May of 2003 to review a near final draft of the report. Final revisions will be made with a target date for delivery to National Sea Grant and the Congress in September 2003. Participation in this national study that could impact commercial use of the EEZ gives Hawaii and Pacific interests an opportunity to “get in on the ground floor” in developing a new national initiative for farming federal marine waters.

2.3 Hawaii Ocean Mapping Project

Dr. Leonard Young of ADP and Dr. Charles Helsley of the University of Hawaii (UH) combined efforts to receive initial funding from the National Sea Grant Office to determine and map potential offshore aquaculture sites within the waters of the main Hawaiian Islands, including identifying potential sites for offshore aquaculture parks. A team was assembled consisting of ADP, UH and the Coastal Zone Management Program (CZM) of the Department of Business, Economic Development and Tourism, which has considerable expertise in computerized Geographic Information Systems (GIS).

Funds of $95,000 were received from the Sea Grant strategic initiative for Phase I of the work. Currently Phase II of the project is being completed with additional federal funds from the Coastal Zone Management Program. Objectives include:

1) Review of the Phase I and II site characteristics of the HOARP project to develop a checklist of good site baseline characteristics.

2) Identify and review existing oceanographic, biological and ecological data from Federal, State, University and private sources, as well as determine existing and future commercial, military and recreational use patterns to anticipate and mitigate multiple use conflicts.

3) Gather and analyze information and put it into a computerized GIS System and use the database to determine the best sites for offshore aquaculture farming.

4) Identify and evaluate Federal and State policies and regulatory regimes governing open ocean aquaculture development in Hawaii and formulate recommendations for changes that would streamline development.

Significant outputs from Phase I of the work include:

1) A global review of pertinent literature to describe factors the affect optimal location for offshore farming has been carried out and analyzed.

2) Sets of existing data for mapping purposes were gathered and are being standardized and inputted. Important physical characteristics of acceptable sites include sediment composition and current speed. Important regulatory classifications are being mapped.

3) Analysis of policy options for Hawaii is underway based on the global literature review and the local experience with four State commercial lease applications.

Efforts will continue in Phase II to focus on creation of useful GIS maps of State marine waters around the main Hawaiian Islands and development of recommendations to improve State leasing policies and processes.

2.4 New Species Research

The future of offshore aquaculture expansion for Hawaii is dependent on development of mass hatchery techniques for a variety of economically important native species. Existing policy does not permit stocking exotic species offshore.

Currently, native pearl oysters are available and the only fish species that makes economic sense and is available in sufficient quantities, is the Pacific threadfin or moi. But, the challenges to the control of the life cycle of marine fish species are formidable because of difficulties in spawning broodstock and the extremely small larvae that hatch. Providing sufficiently small and nutritious live and artificial feeds to newly hatched marine fish larvae is a major bottleneck to commercial development everywhere.

However, public and private sector researchers in Hawaii continue to collaborate in actively pursuing development of new species, to illustrate:

1) The University of Hawaii, Hawaii Institute of Marine Biology (HIMB) is actively studying the fisheries biology of the deep-water snappers ehu, onaga and

opakapaka, with support from the State and the UH Sea Grant College Program. Initial experiments to grow out larvae are promising on a laboratory scale. These efforts have recently been extended through collaborative research with Kona Blue Water Farms, Inc. (KBWF) and their new research hatchery facility in Kona.

2) The Oceanic Institute (OI), with federal and state funding, has been carrying out extensive hatchery work on several local ocean species. Building on their success in mass-producing moi fingerlings, OI scientists are producing limited quantities of stockable size amberack and other related jack species (Ostrowski, 2001, Sing 2002). At the same time, OI researchers are improving on large scale, hatchery-rearing techniques for moi.

3) KBWF, a private facility at the Natural Energy Laboratory of Hawaii Authority (NELHA), recently received a three-year, $1.5M federal grant to develop a live feed system for marine fish larvae. The grant is from the Advanced Technology Program in the U.S. DOC, which provides monies to advance challenging research and development projects that have broad-based economic or social benefit. Targeted fish species for this project include the mahimahi, deep-water snappers, kahala, and a local grouper (PBN, 2001). Construction of the research facilities have recently been completed and broodstock of the target species are now on site and some snapper larvae are being reared.

3.0 Status of Commercial Development

3.1 Status of Initial Lease Applications

Passage of the amendments to Chapter 190D, HRS in 1999 and the success of the HOARP project, led to two companies beginning the new process to obtain a lease. These companies became the initial "test cases" for the State's ocean permitting and leasing processes. Both were active in the 1999 Legislative process to amend Chapter 190D, HRS, and both had complimentary business experiences that made them excellent candidates to be the "pioneers" to work out the details on how the ocean leasing law, as amended, will be implemented. The companies were Cates International (CI) of Honolulu and Black Pearls, Inc. (BPI) of Kailua-Kona.

CI was formed to pursue open ocean commercial cage culture of fish in Hawaiian waters. The principals had considerable experience with commercial fishing, diving, boating services, as well as business. CI personnel were an instrumental part of the team that carried out the highly successful HOARP project. CI decided to purchase similar cages from the same company, Net Systems of Brainbridge, Washington, to grow moi at a site near the HOARP site, off Ewa Beach, Oahu.

On April 10, 2000, CI submitted all Federal, State and County permits for a four-cage project using 28 acres of ocean two miles off Ewa Beach, Oahu. Processing began shortly after the submission on the key U.S. Army Corps of Engineers permit and the DLNR Conservation District Use Application (CDUA) permit. CI began the process, which included numerous meetings with community interests and State agencies, a public hearing and responding to comments on their Environmental Assessment. The company also had to deal with the filing of a contested case hearing with DLNR by several members of the native Hawaiian Community, who objected to the site chosen and which was ultimately dropped.

On March 9, 2001, approximately 12 months after the DLNR accepted the application; the Board of Land and Natural Resources (BLNR) authorized a lease. This was not only the first lease approved under the amended Chapter 190D, HRS, but is considered by Federal officials to be the first open ocean aquaculture lease in the nation (Sea Technology, 2001). The actual lease document was signed in August of 2002.

Since the lease approval, CI has followed its business plan and to date has deployed and repeatedly stocked two submersible cages. Due to shortages in the supply of fingerlings, the two cages have never reached optimum stocking densities. However, weekly production has steadily increased to approximately

7,000 pounds a week by the end of 2002. Sales are directed at local restaurants and seafood markets, and “white table cloth” restaurants on the West Coast.

Future plans include deployment of the two remaining cages on the Ewa Beach site, as market demand justifies. In addition, the Company intends to look for an additional site to grow other species in the near future.

The second pioneering company, BPI is located at NELHA in Kona. It is a cutting-edge research and development company that consults in pearl oyster hatchery development and develops commercial pearl farms around the world. Pearl oysters are grown using hanging culture techniques, where oysters seeded with pearl forming nuclei are hung in baskets from lines supported by buoys, and utilize natural ocean productivity as food.

Of particular interest to marine resource managers at DLNR, BPI’s native cultured pearl oysters will naturally re-seed and increase depleted wild stocks of oysters, while they go through the lengthy pearl making cycle. As a public benefit of pearl farming, wild stocks of native black pearl oysters would increase over time in the general vicinity of a farm and eventually in the long term around the Islands. This species re-establishment occurs at no cost to the State.

On October 5, 2000, BPI submitted all its Federal, State and County permits for a 75 acre site in the borrow pit off the Reef Runway at the Honolulu International

Airport. BPI likewise began the process which included numerous meetings with community interests and State Airport and agency officials, a public hearing, and responding to comments on the Environmental Assessment.

On August 24, 2001, approximately 11 months after DLNR accepted the application, a lease was authorized by BLNR. BPI thus became the second lease authorized under the amended Chapter 190D, HRS. However, prior to execution of the lease, as a condition of the approval, a rule change is necessary to remove the 75 acre site from a State designated 700 acre Thrillcraft Area off the airport.

Currently, BPI is waiting for DLNR's Division of Boating and Ocean Recreation (DBOR) to hold a public hearing on the proposed rule change before it goes to the Board of Land and Natural Resources for approval. DBOR has worked with the thrill craft and boating community to develop an acceptable compromise for removing the aquaculture site and adding additional acrage to the thrillcraft area. Once the rule change is final, DLNR Land Division can issue the lease and the project can move forward.

3.2 New Interest in Commercial Leases

With the success of CI and BPI in obtaining leases, interest continues to grow from local, national and internationally based entities. Internationally, companies

from several prominent nations in offshore aquaculture have indicated strong interest in the results of the Hawaii cage research, as well as the process for securing a commercial lease. Likewise nationally, at least one company has requested information on the process. Locally, several individuals have expressed interest, several companies have applications in process, a community group in Waianae has carried out a feasibility study for community-based offshore aquaculture, and two other companies are actively looking for sites.

The local companies that have submitted applications, include a group proposing cage culture of tuna, Ahi Nui Tuna Farming Company and KBWF, who is interested in finfish culture off the Big Island. Tuna farming has been demonstrated technically and economically feasible in several places in the world.

KBWF submitted their CDUA application, with attached detailed Environmental Assessment, in November 2002. The submittal was preceded by numerous meetings and discussions with State and Federal agencies and the Kona community. KBWF plans to initially raise mahimahi with a series of small-to-medium-size net pens off Unualoha Point, Kona. Hatchery techniques are well known for mahimahi, but grow out in offshore ocean cages has not been tried before.

The pens will be anchored in 150 feet to 200 feet of water to avoid exposure to high surf, minimize environmental impacts on coral reef and avoid conflict with fishing and recreational diving. If research is successful, at the Company's Kona-based marine finfish hatchery, other species such as the deep-water snappers, opakapaka and ehu, will be grown (Wedemeyer, 2001). As mentioned above, KBWF has received a $1.5M grant from the DOC to help pursue this work.

The Ahi Nui Tuna Farming Company submitted its Federal and State permit applications and State lease request in July 2002. The project proposes to place floating net cages 4.5 miles northwest of Kawaihae Harbor in West Hawaii in approximately 170 feet of water. The total site size, including the mooring system, is 216 acres and the cages will occupy 16 acres of surface water.

The cages will be used for grow out of wild caught juvenile big eye and yellow fin tuna that are caught on barbless hooks on the fishing grounds in the Western Pacific. Captured juvenile tuna are transported to the anchored net cages in transport cages towed by a fishing boat. Upon completion of the grow-out cycle of four to eight months, the tuna will be harvested, processed and sold, primarily into the international sushi and sashimi markets. This type of system is currently in commercial use to grow another species, blue fin tuna, in Australia, Spain, Portugal, Mexico and the Canary Islands.

As of this writing, the project has carried out extensive communications with the West Hawaii community and a public hearing. Based on the community input on the Draft Environmental Assessment, the Company is considering what modifications to the project are needed to address issues raised by the community; which may include moving the project to a new site. Though the project intends to start small, the goal of the project is to sustainably produce over four million pounds of tuna annually from eighteen cages.

3.3 Current Issues of Concern

Long-term leasing of ocean space is new for Hawaii and the concept has raised many issues and questions for discussion. There is a tradition of managing the ocean around the Islands as a common property resource. Moreover, there is a diverse pattern of existing use of the marine environment by the military, ocean-related businesses and the public. DLNR and DOA's ability to work with collaboratively with applicants and the public to resolve issues will have a major impact on the long-term feasibility of ocean leasing for Hawaii.

Two ocean leases have been authorized by DLNR and the process described by Chapter 190D, HRS, tested. Initial concerns about the process, such as opportunity for public input, ceded lands payments, monitoring procedures, and mitigation of multiple use issues, have been satisfactorily dealt with in the course of the initial implementation. The one active lease to Cates International Inc. for

moi production has clearly demonstrated that a well sited and managed cage farm can be operated in an environmentally sustainable way, since there has been no use conflicts and nutrient inputs from the fish have been barely measurable outside the cage.

With the two new lease applications for the tuna and mahimahi farms, certain issues have re-occurred and several new concerns are being raised – specific to the locations of the projects. Among the most significant concerns raised by the community are: a) pollution potential of the ocean from fish wastes and uneaten food; b) multiple use conflicts as reflected in comments that cages are located in locations frequently used for fishing and diving; c) danger of marine mammal entanglement in cages; d) attraction of dangerous sharks to the area of the cage; and e) spoilage of a clear ocean view by having sea cages on the surface of the ocean. Companies are actively discussing these issues with government and community representatives to attempt to develop appropriate mitigation strategies.

4.0 Conclusions

Chapter 190D, HRS, was amended by the Legislature and signed into law in July of 1999, to allow Hawaii to examine open ocean aquaculture leasing and significant has been made in the ensuing three and one half years. Shortly after the changes were signed into law, a coalition of the University of Hawaii Sea

Grant Program, the Oceanic Institute and the State ADP carried out a highly successful, multi-year cage culture demonstration project, HOARP, off Ewa Beach, Oahu. While this experiment was going on, two pioneering companies, Cates International and Black Pearls, Inc., came forward and submitted the first commercial lease applications under the new law, which they ultimately obtained in March and October, 2001, respectfully.

DLNR has clarified the regulatory and leasing process to move aquaculture offshore in environmentally and economically sustainable ways. Moreover, projects are being carefully monitored so that decision-makers and the public have the information to evaluate ocean leasing for aquaculture as a long-term opportunity for Hawaii.

As expansion continues, DOA/ADP will continue to play the role of the facilitator and liaison between companies requesting leases and the regulatory agencies. DOA/ADP also assists companies in packaging permit applications. The Land Division of DLNR (LD/DLNR) is the responsible agency for determining environmentally acceptable resource uses and the conditions for granting the CDUA permit. LD/DLNR is also the agency that issues and administers the long-term ocean leases. Ultimately, BLNR decides on the issuance of the individual CDUA permit and lease on a project-by-project basis.

In terms of the Federal role, the U.S. Army Corps of Engineers' permitting process determines how and where cages can be anchored in State ocean waters. Further, the Corps currently is the main permitting agency for Federal marine waters, i.e., the U.S. EEZ, 3 miles to 200 miles from shore. Presently, there is no federal leasing regime for the EEZ.

These initiatives by State, University and private sector interests have pushed Hawaii to the forefront of U.S. efforts in national ocean aquaculture development. National interest in developing aquaculture in state and federal marine waters continues to build, justified by the urgent need to increase domestically produced seafood supplies. Hopefully the effort will be supported with new and increased federal research funding. With the solid track record by the State, University, and private research and farming communities, Hawaii continues to be well positioned to take advantage of this emerging sector of the U.S. aquaculture industry.

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